

**Title:** Relation Between EEG Measure of Frontal Alpha Asymmetry and Anger Regulation

**Authors:** Alexis Breed, Olivia Subramani, Matthew Copello, Darryl Burnet, Ahlam Awaid, Dominic Parrott, Jessica Turner, Matthew Turner

**Faculty Advisor:** Jessica Turner

## Introduction

Power in the alpha frequency range (8-13 Hz) has been argued to be inversely related to greater cortical activity (Allen et al., 2004). These asymmetries relate to multiple emotional traits and responses, including approach/avoidance (Coan & Allen, 2004), and aggression (Peterson et al. 2008). We examined resting state frontal alpha asymmetry (FAA) using electroencephalography (EEG) and related that to trait anger and anger expression. Individuals with higher alpha asymmetry scores were expected to have greater left frontal cortical activity, which has been associated with trait anger.

## Methods

Forty female participants were involved in a single testing session in which they completed the Behavioral Inhibition/Activation Scales (BIS/BAS), the Trait Anger Scale (TAS), and the Anger Expression Inventory (AEI) as well as and an EEG recording as part of a larger experiment. The EEG recording included five minutes of baseline data, split between eyes closed and eyes open, that were collected using the 14 electrode portable EPOC+ headset. We calculated alpha power for each electrode on the left and right hemisphere. Then the FAA was calculated using the equation:  $(\ln[\text{right alpha}] - \ln[\text{left alpha}])$ . Each FAA was averaged across eyes open and closed conditions. The resulting FAA was correlated with total scores for trait anger, anger expression subscales (Anger Out, Anger In, and Anger Control), and behavioral activation and inhibition.

## Results

Only right handed participants who provided EEG data of sufficient quality were included, leaving a final sample of 27 participants. We found a positive correlation between FAA on the frontal electrode pair and Anger-In ( $r = .447, p < .05$ ). Significant correlations were not detected found between FAA scores and the BIS/BAS, trait anger, Anger-Out, or Anger Control.

## Discussion and Conclusion

The positive correlation between the frontal FAA and Anger In support the idea that left frontal cortical activity is associated with anger dysregulation. We were expecting to find a correlation between BIS/BAS and FAA since there has been research supporting this correlation. Surprisingly, we did not find anything, though this may change with more participants.

**Keywords:** EEG, Trait Anger, Frontal Asymmetry

**References:**

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